

Figure S1. Titration of optimal Vc concentration to use in the study. 1 mg/kg, 10 mg/kg, 100 mg/kg and 300 mg/kg Vc were i.p. injected into the mice from day -7 until day 21, as reported in Figure 1. Alum-OVA was administered on days 0, 14 and 77 and spleen was harvested on day 91. n=3 in each group. DHE MFI (ROS levels) are reported in the Figure. Data are shown as mean \pm SEM. One-way ANOVA, Tuckey post-hoc test. ***p < 0.001.

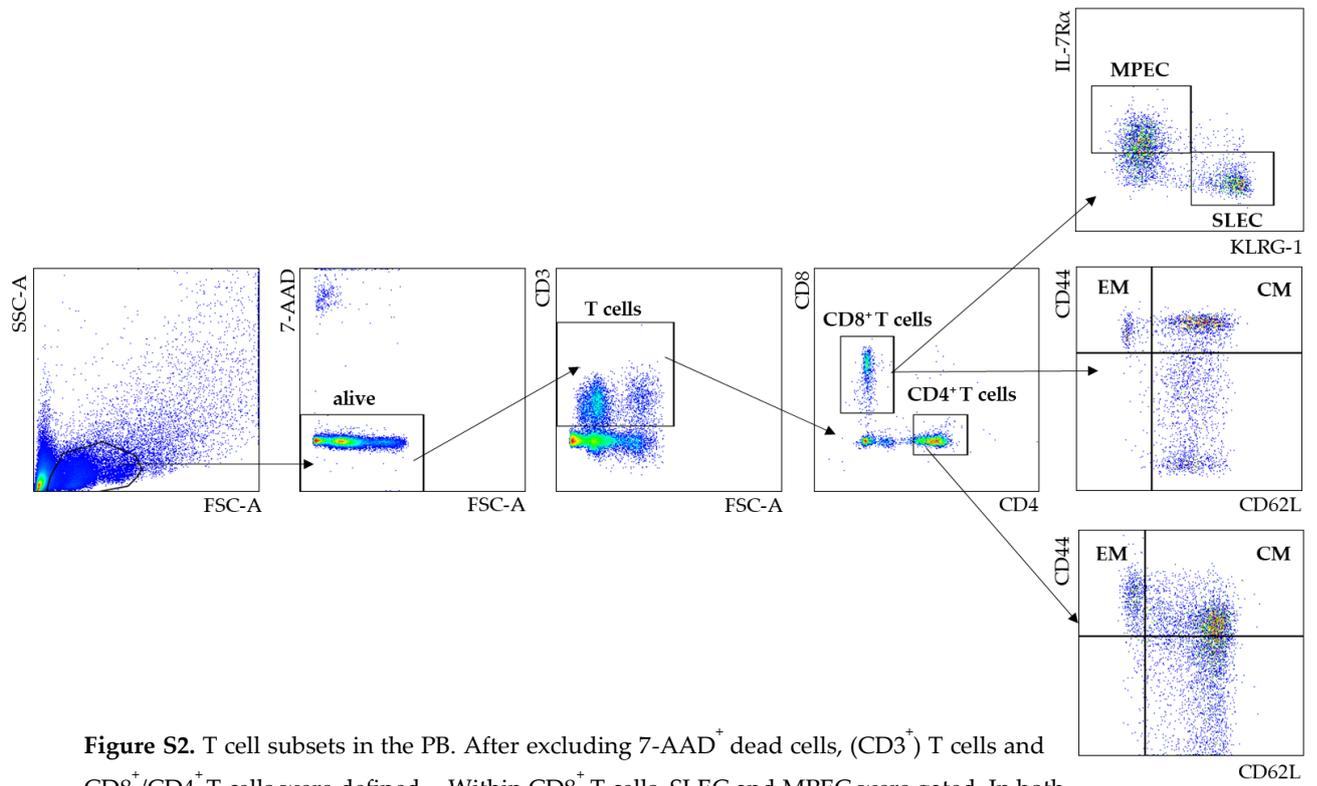


Figure S2. T cell subsets in the PB. After excluding 7-AAD⁺ dead cells, (CD3⁺) T cells and CD8⁺/CD4⁺ T cells were defined. Within CD8⁺ T cells, SLEC and MPEC were gated. In both CD8⁺ and CD4⁺ T cells, EM and CM cells were defined.

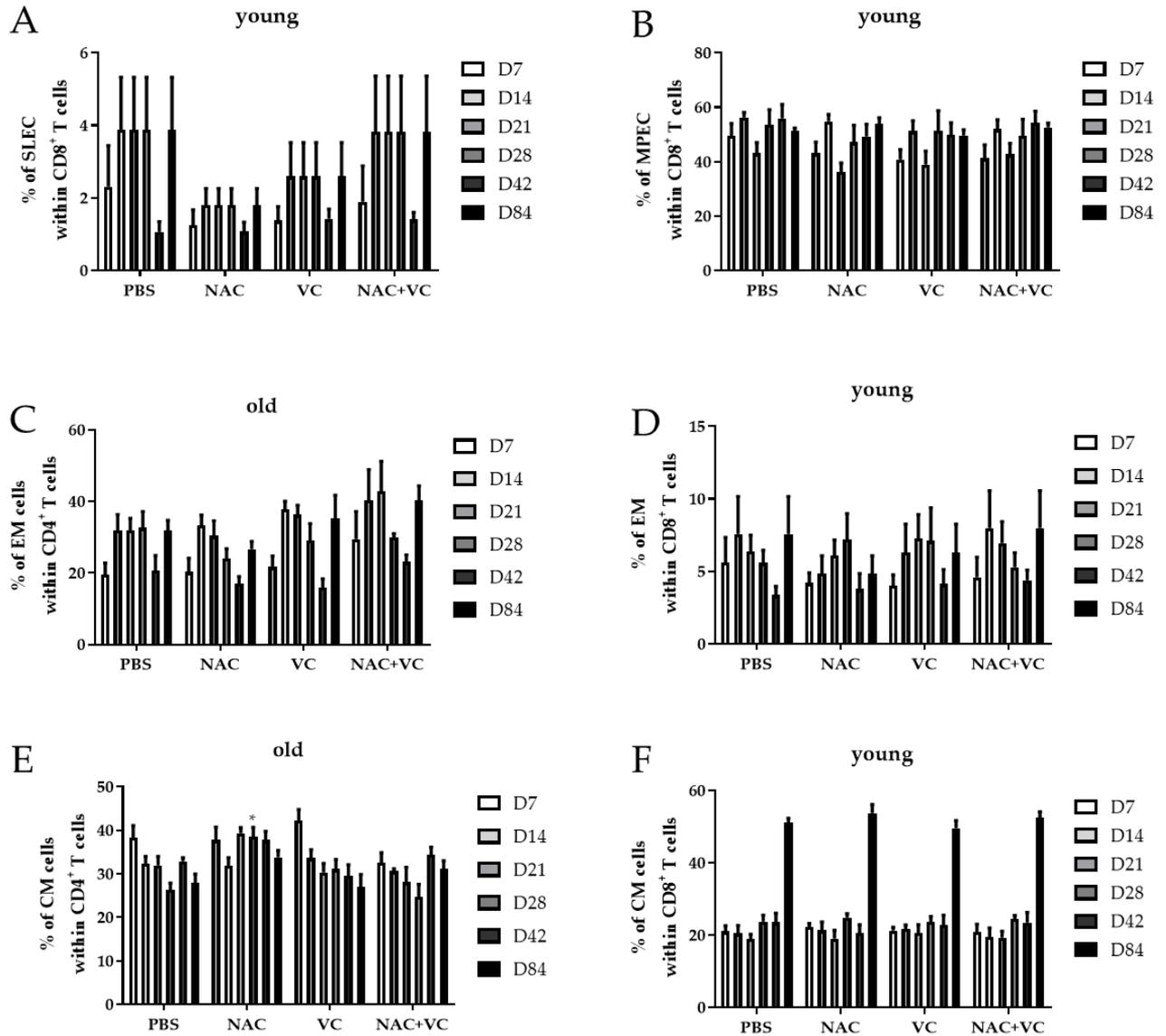


Figure S3. Effector/memory T cell subsets in the PB of young and old mice. Frequency of (A) SLEC in young mice, (B) MPEC in young mice, (C) EM CD4⁺ T cells in old mice, (D) EM CD8⁺ T cells in young mice, (E) CM CD4⁺ T cells in old mice and (F) CM CD8⁺ T cells in old mice treated with PBS, NAC, Vc or NAC+Vc. Blood was harvested on days 7, 14, 21, 28, 42 and 84. Data are shown as mean \pm SEM. Two-way ANOVA, Tukey post-hoc test. * $p < 0.05$.

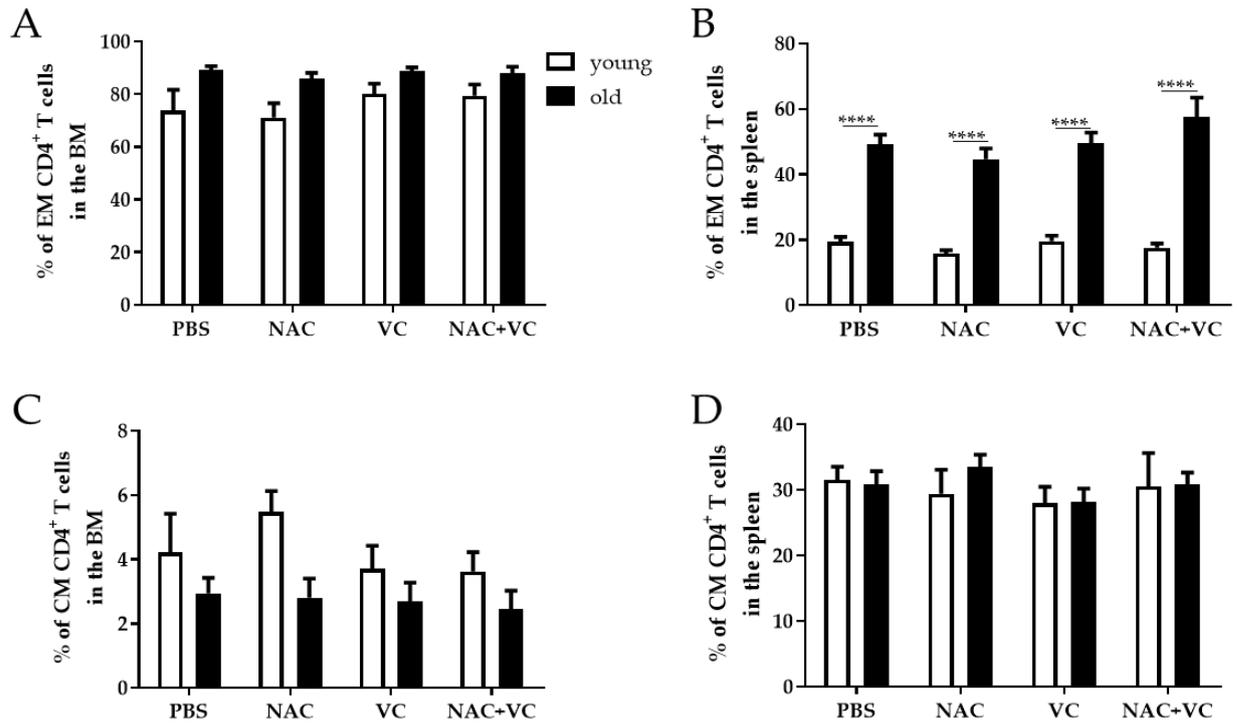


Figure S4. Effector/memory T cell subsets in the BM and spleen of young and old mice. Frequency of (A) EM CD4⁺ T cells in the BM, (B) EM CD4⁺ T cells in the spleen, (C) CM CD4⁺ T cells in the BM, and (D) CM CD4⁺ T in the spleen of young (white columns) and old (black columns) mice treated with PBS, NAC, Vc or NAC+Vc. Data are shown as mean \pm SEM. Two-way ANOVA, Tukey post-hoc test. * $p < 0.05$.

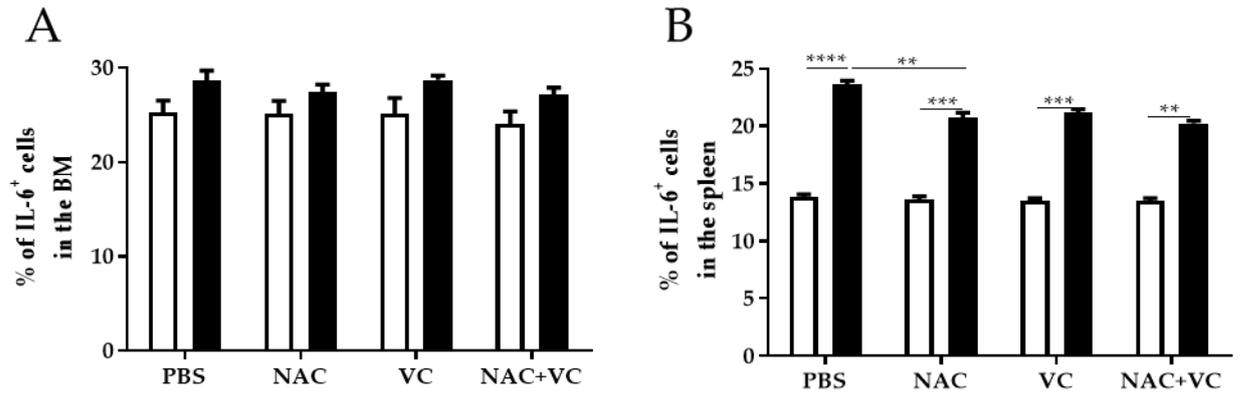


Figure S5. Frequency of IL-6⁺ cells in (A) BM and (B) spleen of young (white columns) and old (black columns) mice treated with PBS, NAC, Vc or NAC+Vc. Data are shown as mean \pm SEM. Two-way ANOVA, Tukey post-hoc test. ** $p < 0.01$; **** $p < 0.0001$.

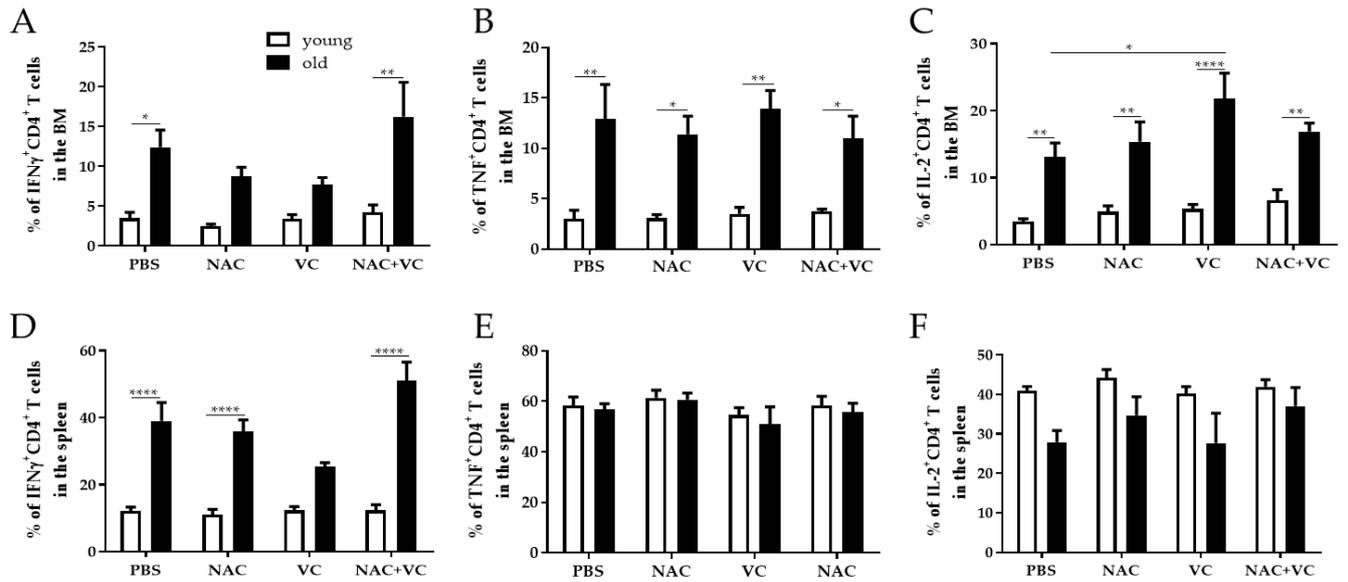


Figure S6. Expression of pro-inflammatory molecules within CD4 $^+$ T cells in the BM and spleen. (A) IFN γ^+ , (B) TNF $^+$ and (C) IL-2 $^+$ CD4 $^+$ T cells in the BM, (D) IFN γ^+ , (E) TNF $^+$ and (F) IL-2 $^+$ CD4 $^+$ T cells in the spleen of young (white columns) and old (black columns) mice treated with PBS, NAC, Vc or NAC+Vc. Data are shown as mean \pm SEM. Two-way ANOVA, Tukey post-hoc test. * $p < 0.05$; ** $p < 0.01$; **** $p < 0.0001$.

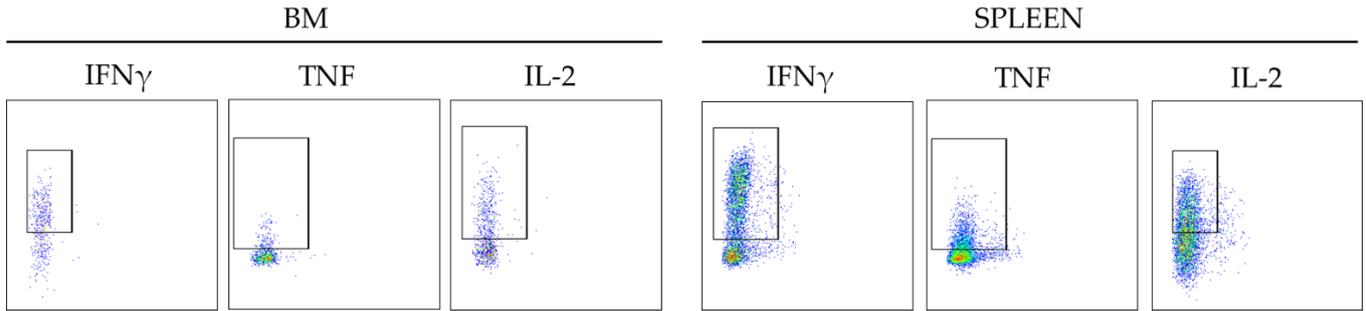


Figure S7. Representative FACS plots showing the expression of IFN γ , TNF and IL-2 within CD8⁺ T cells from BM and spleen of an old untreated mouse.

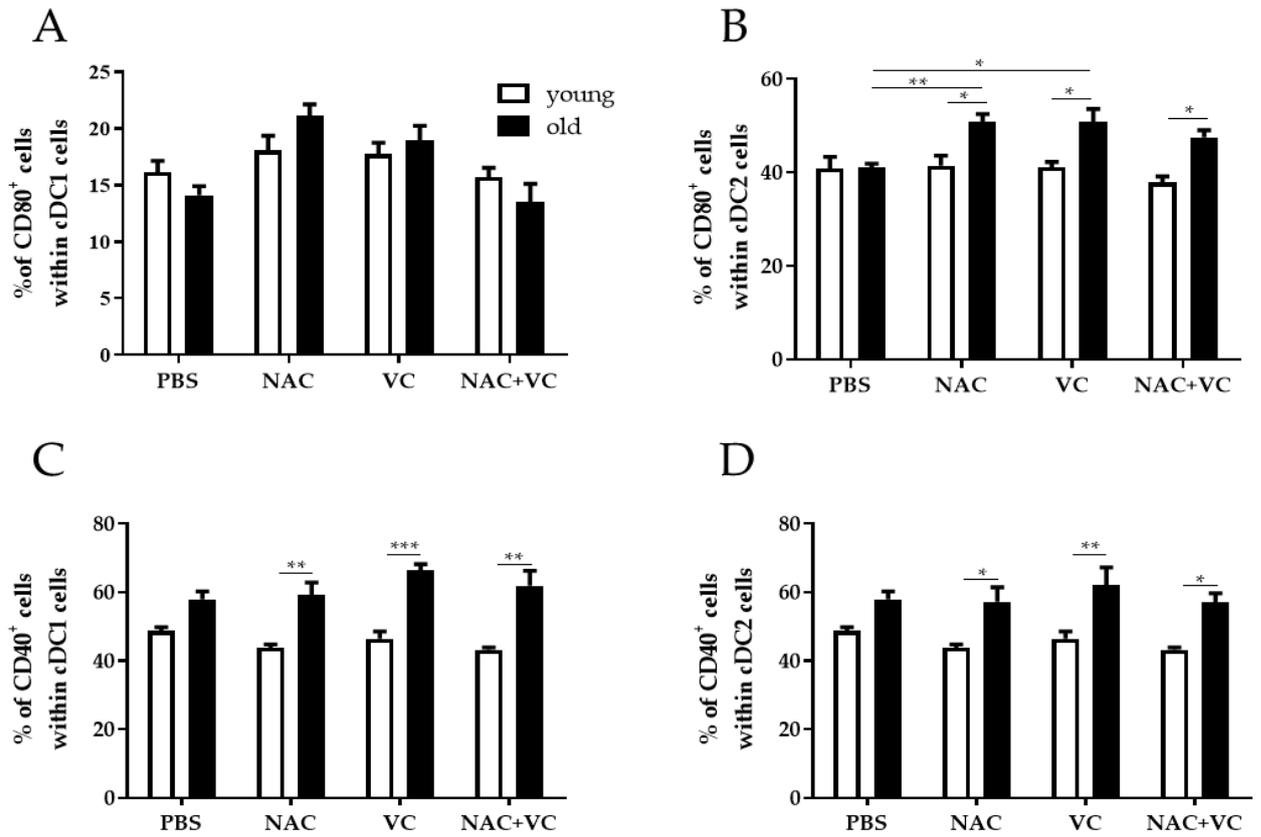


Figure S8. Frequency of CD80 and CD40 in DC subsets. Frequency of (A) CD80⁺ cells in cDC1 cells, (B) CD80⁺ cells in cDC2 cells, (C) CD40⁺ cells in cDC1 cells, (D) CD40⁺ cells in cDC2 cells in the spleen of young (white columns) and old (black columns) mice treated with PBS, NAC, Vc or NAC+Vc. Data are shown as mean \pm SEM. Two-way ANOVA, Tukey post-hoc test. *p < 0.05, **p < 0.01, ***p < 0.001.